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18 December 1984

West Europe Report

SCIENCE AND TECHNOLOGY

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CONTENTS

ADVANCED MATERIALS

METHOD FOR FORMING ELECTROMAGNETIC-WAVE-SCREENING COMPOSITE

Stockholm PLASTFORUM SCANDINAVIA in Swedish No 7-8, 1984 pp 54-55

[Text] There are a number of ways to give plastic parts the ability to screen out high-frequency electromagnetic waves. Stellana Plastics, Inc. of Laxa is now introducing another interesting method. It consists of a one-stage injection molding process for forming a thermoplastic sandwich whose plastic core, containing metal flakes, is coated with a surface layer of ABS. The method employs the Battenfeld two-component injection molding machine.

The electronics industry always uses screened housing for its equipment in order to prevent ingoing or outgoing electromagnetic waves from interfering with operations. Leaking radiation can block the transmission and reception of radio and TV signals and interfere with other equipment used in control engineering and regulation techniques. Since plastic material is an electrical insulator, electromagnetic waves and fields up to a frequency range of 100 GHz are allowed to pass.

It is possible, however, to introduce screening properties into plastics by mixing in conducting materials or adding a conducting surface coating. Perhaps the most common method in use today consists of applying conducting varnish to the product. Another method consists of placing a metallic insert in the product.

There are many other screening methods: for example, various ways of adding metal to the plastic surface (metallizing, flame spraying, and so on).

The disadvantage of those methods is that they require special operations before or after the actual forming, with the result that the cost of the part is quite high.

Sandwich With Aluminum Flakes

Stellana Plastics, Inc. of Laxa has a special injection molding machine that can produce sandwich material in one shot. The machine is normally used for parts to be made of structural foam but requiring a good surface finish. This often applies to furniture and interior fittings that are given a foamed core and also

provided with a 1-millimeter-thick surface layer of thermoplastic material with good finishing properties.

The injection machine has two injection units with a total injection capacity of 8,000 cm^3. The press can close with 850 Mp (about 8,500 kN), and the distance between the pillars is 1,200 mm x 1,200 mm. The machine can therefore handle parts that are quite large, and one marketing area is unquestionably that for the housings used in the electronics and computer industries.

Parts of this kind can be produced as a sandwich with electrical conducting material in the core and finish material on the outer layer. The entire sandwich is produced by two-component injection molding, and the product is consequently finished when it comes out of the machine.

The problem until now has been to find a suitable core material with adequate screening properties. But such a material has now been found in the United States. Mobay, the U.S. subsidiary of Bayer, has developed that material, which is a Bayblend (an alloy of polycarbonate and ABS) with a 40-percent admixture of aluminum flakes.

The entire project is completely new, and so far only small test quantities are obtainable.

Two Grades

Mobay has produced the new metal-plastic composite in two different grades known as Bayblend ME 6540 (flame resistant) and Bayblend ME 2540 (which is not flame resistant but is, on the other hand, a little more impact resistant). The flame resistance is "VO" according to UL 94 at a thickness of 3 millimeters, meaning that the sample does not burn for more than 10 seconds after the flame is removed and that no burning droplets are formed that might ignite material underneath. The screening effect of the flame-resistant variety is about 50 dB at frequencies between 0.5 and 1,000 mHz. The other variety provides somewhat better screening: about 60 dB at the same frequencies.

A screening effect of between 30 and 60 dB is usually considered average to good, while the range from 60 to 90 dB is considered very good. This means that 50 and 60 dB are good values, and in most situations, no further screening is required.

Both grades of this material are compounded especially for two-component injection molding with a surface layer either of Bayblend or of one of the two alloying materials: polycarbonate or ABS. This makes it possible to produce a functional material with a screening inner layer and an esthetic outer layer all in one pass!

Material Also Reflective

Another field of application for the metal-plastic composite concerns its use as a reflector of electromagnetic waves. This property can be used, for example, in antennas to deflect radio waves to a specific point--the antenna receiver

(parabolic antennas). As the reader surely realizes, that area of development is already being pursued.

Stellana Plastics in Full Swing

Stellana Plastics is part of the Yxhult Group, which normally works in the building materials industry. The group's well-known trade names are Ytong, Mexi, and Rectisol. Stellana is active in two areas: it produces its own products in the form of wheels and also does contract work to produce what it calls "partner products." There are 135 employees, and it is estimated that turnover for 1984 will total 60 million kronor.

Managing director Bengt Gronwall is especially pleased with a product called Stellaroll, which won the Swedish prize for plastics this year and is also on the way to becoming a real hit on the U.S. market. Stellaroll is a U bolt (model PA6 with glass fibers) combined with low-friction wheels. The combined product is intended for use on conveyors, and compared to equivalent metal products, Stellaroll reduces the noise level by 10 dB, which the human ear perceives as a 50-percent reduction in the noise level. Volkswagen was one of the first to invest in the system, and now General Motors and Ford are following close behind.

Another Stellana product that has become a hit is the so-called Beach Box, a watertight tube with a fashionable look that swimmers use as a place to keep keys, money, and so on.

Stellana's inventive chief of development, Leif Ernefelt, has a number of projects underway in connection with the injection-molded sandwich, but this is where we run into the wall of censorship. That censorship also covers an entirely new production technology that will get underway later this year [1984] in cooperation with a Canadian partner. Leif promises us many surprises this fall!

11798
CSO: 3698/69

BRIEFS

ALL-COMPOSITE AIRBUS EMPENNAGE--In Toulouse, an Airbus will be equipped with a vertical empennage (45 sq-m and over 12 m high) whose framework is built entirely out of carbon fibers and epoxy resin in the form of two pre-impregnated Fibredux units. One is based on a Brochier SA carbon fiber technical cloth, and the other on unidirectional carbon fibers, with an Araldite epoxy resin matrix in both cases. This frame is a forward step in the utilization of high performance composites for aircraft construction. Its study began in 1978 at Messerschmidt-Bolkow-Blohm, near Hamburg, at the initiative of the German government. The goal was to demonstrate that the operating costs of a commercial airplane could be lowered without reducing its flight safety, by using support structures made of high performance composites. With 20 percent less weight, composite frames should be fully interchangeable with metal frames and meet the same navigability specifications. Their external geometry and attachment points to the fuselage, leading edge, and rudder should therefore be identical to those of metal structures. Moreover, their mass production had to be automated as much as possible for economic reasons. These requirements having been met, five planes will be equipped with a composite empennage framework for flight tests which will begin this year. [Text] [Paris COMPOSITES ET NOUVEAUX MATERIAUX in French Sep 84 p 6] 11,023

COMPOSITE BATTERIES--Among other applications, lead based composite materials reinforced with mineral fibers, can help improve lead batteries for electric vehicles. The Laboratory for Mineral Physico-Chemistry, associated with CNRS (National Center for Scientific Research), has perfected in collaboration with the European Battery Company (CGE group) and Societe J. Brochier, a technique which makes it possible to impregnate with lead the "core" of the thousands of strands contained in the fiber tufts. The impregnation is performed by electrolytic lead deposition following copper plating of the fibers when they are not sufficiently conducting. This patented process, compatible with continuous production, is carried out in air at ambient temperature. It can be used with various fibers. For instance, it makes it possible to impregnate a cloth of mixed carbon and glass fibers to produce negative plates which behave electrochemically like lead, but whose weight is four times lower than that of conventional lead alloy plates. Research in progress is aimed at increasing the rigidity of these composite plates and at producing positive ones. [Text] [Paris COMPOSITES ET NOUVEAUX MATERIAUX in French Sep 84 p 6] 11,023

CSO: 3698/89

AEROSPACE

FRG EXPECTED TO BOOST SPACE BUDGET DRASTICALLY

Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German 11 Oct 84 p 7

[Article: "A Further Technology Boost Is Expected: The FRG Intensifies Space Activities/Decisions on Columbus and Ariane"]

[Text] abc. Frankfurt. In November 1984 the Federal Cabinet will probably make far-reaching decisions regarding the future space policy of the FRG. These decisions will have the consequence that the FRG's previous space expenditures of about 800 million marks annually must in the coming years be increased by as much as 50 percent in order to measure up to existing political decisions. Within the Federal Government at the present time conversations are in progress which are designed to establish our future space policy. It amounts to this, that Europe, building on the development of a successful launching rocket and of a proven scientific program for space research is now further developing its cooperative activities over the long term. There are two new program proposals which must be decided upon:

i. on European participation in a space station proposed by the United States and including a European contribution (Columbus) and

ii. on the development of a new generation of European launching rockets (Ariane 5) including a new propulsion system.

The two projects are mutually supporting. They presuppose that the current European programs in space research will be continued. The financial burdens arising from the two new programs are estimated within the Federal Government to amount to 4.5 billion marks up until 1996 of which 2.9 billion will be for participation in the space station and 1.6 billion for the development of the Ariane launching rocket. In order to carry out this program in addition to existing space research programs it will be necessary to increase research funds in 1986 by 190 million marks and in 1987 by 372 million marks and in 1988 by 526 million marks. In November the Federal Cabinet will probably make the following determination:

i. Participation in the American space station with the Columbus program and also the further development of the European Ariane launching rockets are projects having far-reaching importance for Europe, for German-French

relations and for transatlantic cooperation. Therefore the German Federal Government approves preparatory programs for the development of these projects. This will at the same time achieve a balanced participatory and financial relationship with France.

ii. The federal minister of research and technology is therefore commissioned to carry out negotiations with the United States on cooperation in the space station, on the basis of the Columbus program, jointly with its European partners and also to carry out negotiations for the continuation of European launching rocket development.

The Cabinet, on the basis of documents provided by the research minister, will promptly come to a decision regarding continuation of German participation after the end of the preparatory phase. The expected increase in financing required for the space program will be defrayed by increasing research funding in the research budget.

This means that while the Federal Cabinet basically approves of the two programs a final decision is to be made only after completion of the preparatory phase.

An extensive description of space activities in Europe and in particular in the FRG was given to the Federal Cabinet to assist it in coming to its decision. Of special importance in that presentation are the scientific engineering perspectives opened up by European participation in the space station and by the development of the European launching rockets. According to the view of the federal government the developments and use of continuously operated space stations and the associated transport facilities promise a technological boost which will be no less than that set off by Sputnik 27 years ago.

The space station calls for hitherto unknown levels of reliability, precision and of capacity to control complex technical systems. In addition, the ability to achieve such technical peak performance is at the same time a convincing evidence of general technical competence. Such a program may in particular be expected to provide strong stimuli in the areas of automation, robot technology, materials research, process technology and manufacturing technology as well as in data processing and telecommunications. Space stations will open up new dimensions in the exploitation of space:

i. as space laboratories for fundamental research and for practical industrial research;

ii. as an observing station for looking into the universe and surveying the entire earth;

iii. as a maintenance and repair facility for satellites, space platforms and observatories;

iv. as a construction site for larger structures and finally in the distant future possibly also

v. as a workshop for production.

The presence of human beings, which in the visible future must be considered to be indispensable in handling the tasks envisaged, also permits a multitude of research studies to be carried out in human physiology, medicine and biology. But also space stations, in consequence of the required development of intelligent automata for maintenance repair and construction tasks in earth orbit will enlarge the spectrum of possible applications of unmanned space travel.

As compared with the present generation the new generation of Ariane launching rockets will exhibit substantial improvements in terms of reliability, payload and economy. The anticipated new high performance power plant imposes extraordinary demands on cryogenic technique. The regulating and control systems are based upon the most modern electronics. This program will assure for the long term the maintenance of a favorable European competitive position in space transport and will open up an option for later development and application of manned systems.

In a final evaluation of all the measures to be adopted in this area and in view of the situation existing in America and in the Soviet Union, involvement in space has received the stamp of approval.

8008
CSO: 3698/49

SEP OF FRANCE REORGANIZES TO MEET ARIANE LAUNCH NEEDS

Paris AFP SCIENCES in French 4 Oct 84 pp 27-28

[Article: "Reorganization and Japanese Projects for SEP"]

[Text] In Paris, on 3 October, Mr Roger Lesgards, SEP [European Propulsion Company] chief executive officer, revealed details of his company's internal reorganization and announced that it was creating a joint subsidiary in Japan, with the Seiko company.

"SEP has been given a mandate by France and Europe," Mr Lesgards indicated, "that of providing the propulsion units needed for the Ariane family to sustain a launching rate of one every other month."

To meet this demand and the requirements of industrial series, SEP needs an entirely new organization. In addition, the company must plan for the HM60 cryogenic motor. In other directions, such as composite materials or image processing, world markets exist and SEP must increase its representation there, Mr Lesgards pointed out.

In practice, the main articulations of the company are not altered: the responsibilities of each division were confirmed; each division constitutes an enterprise, but their internal organization was changed.

Thus, a Program Group will be added to the Liquid Propellant and Space Division; it will be in charge of all negotiations with large clients. It will consist of high-level officials and will be headed by Mr Mounier, formerly at the National Aircraft-Engine Study and Manufacturing Company, who, among other things, will deal with the National Center for Space Studies and Arianespace. His role will thus be to institute reliable relations, to go one step beyond making individual alterations to projects as a result of informal dialogues.

As far as the Powder Propellant and Composites Division is concerned, it will be oriented to products, respectively propellants proper, composite materials, and sensors and measuring instruments.

Finally, the Image Processing Division will receive the addition of a technical management.

To complement these local measures, the SEP Paris headquarters will be completed by a piloting team. "Because the company must have a strong unity," Mr Lesgards thus indicated, "and synergy must develop." Piloting will deal with quality and the international policy of SEP.

Two assistant general manager positions are also created. Mr Pierre Betin, former manager of the Powder Propellant Division, becomes responsible for the scientific, technical, industrial and commercial sector and will provide leadership to the divisions on these themes, whereas Mr Philippe Simionesco is entrusted with the economic, financial, legal and administrative aspects. They will supervise a total of eight managers' departments.

The company president will also be assisted by Mr Georges Gratias for labor relations, Mr Andre Garnault for development and strategy and Mr Jean-Louis Rossor for security-related questions. A chief of staff, Mr Yves Cardoso, will supervise and coordinate external communications.

As for the results of SEP, which employs 3,500 people and achieved 1983 sales of over FF 2 billion, Mr Lesgards gave to understand that he was expecting a larger profit this year than in 1983. "Above all," he indicated, "space operations, which represent 40 percent of SEP operations, must produce a profit."

Mr Lesgards also mentioned the agreement signed by S2M [Magnetic Mechanics Company], an SEP subsidiary, and the Japanese group Seiko.

"The joint subsidiary of S2M and the Seiko Instruments and Electronics group became operational on 1 October 1983," Mr Lesgards thus announced.

The agreement involves research, production and marketing of magnetic bearings, a sort of magnetic "ball bearing," without any friction or vibrations: this is a difficult technology involving mechanics and data processing, in which S2M is the only company to have achieved industrial applications.

Indeed, this is a particularly precious component for satellites, robots, high-tech compressors or even X-ray scanners. For the time being, about 300 applications have been realized since 1976, the date of creation of the company which now employs 44 people.

For this alliance, Seiko acquired a 10 percent interest in the S2M capital, which will later on be increased to 20 percent. As a counterpart, the two companies have started a joint venture, the Japan Magnetic Bearings (JMB) company in Tokyo.

A similar operation was made last March with the American company Kollmorgen of Virginia.

9294
CSO: 3698/106

AEROSPACE

REPORT SHOWS SWISS SPACE EXPENDITURES, ADVISES INCREASE

Geneva JOURNAL DE GENEVE in French 12 Oct 84 p 15

[Text] According to one report, Switzerland must double its financial participation to remain in the game.

Bern, 11 [October] (ATS)--In order to continue to effectively participate in space activities, Switzerland must invest more than the 27.5 million allocated so far, which is slightly less than 2 percent of ESA's (European Space Agency) total budget. On Thursday, the Federal Consulting Commission on Space Matters presented a report in Bern, which examines the Swiss participation--public and private--in the space adventure. Its general conclusion is that the country must allocate the means for the policy it selects so as not to find itself alone and out of the game.

The report presented on Thursday in Bern establishes for the first time a figure for Switzerland's participation in space activities, pointing out the advantages as well as the limits of such an endeavor. Intended for the widest possible distribution, it should allow both the population and politicians to form an opinion. Presenting the stakes and the options that exist until the end of this century, it was also written as a fundamental document for decisions which will have to be taken about this area in national and international policies.

Profitable

Switzerland is currently member of four international organizations whose activities concern space: first of all ESA, to which it devotes the bulk of its efforts, and three organizations specializing in applications satellites (Intelsat and Eutelsat for telecommunications, and Eumetsat for meteorology). ESA's most notable success is associated with the Ariane program, the European launch rocket whose operations have proven profitable.

During the past five years, Switzerland has invested about 150 million francs in the space activity, three-fourths of which were provided by the Confederation alone, the remainder coming from the National Fund for Scientific Research (12 million between 1979 and 1983) and industry (33.9 million). An ESA member since 1975, Switzerland contributes nearly 27.5 million to the agency annually. In the opinion of the Christian Democrat Franz Muheim, from the Uri Canton, who is chairman of the federal commission, it would be desirable to double this contribution in order to maintain a sufficient participation.

The commission's conclusions are in fact unanimous: if Switzerland does not increase its contribution, it runs the risk of having to drop a growing number of programs and lose their economic, technologic, and scientific spin-offs. In recent years, it has had to resign itself to non-participation in several important activities, and to contribute only very modestly to other programs, such as Spacelab, in which it had only a 1 percent share.

The commission's report presents the contributions and results of space activities in the areas they have opened or strongly developed, before showing the development prospects and possible orientations of efforts in Switzerland and abroad. It also details the forms assumed by Swiss participation in various types of international cooperations. Special emphasis is placed on the implications of space activities not only for scientific and economic endeavors, but also for political and human affairs.

During Thursday's press conference, it was pointed out that remote detection satellites would soon allow a global and continuous monitoring of almost all national events or events associated with human activities. One member of the commission did indicate that a clear perception of the advantages of this technical progress, compared to the the nefarious consequences of such a total monitoring for mankind, will require a careful evaluation of its socio-political aspects.

Combined Interests

The Federal Consulting Commission on Space Matters brings together representatives from all the federal departments, scientists and industrialists, as well as other interested parties, such as the PTT. Its aim is to provide the best available information on all aspects of space matters and on the possible forms of participation for Switzerland.

11,023
CSO: 3698/57

AUTOMOBILE INDUSTRY

CITROEN EXHIBITS 'ECO 2000' CAR OF TOMORROW

Description of Car

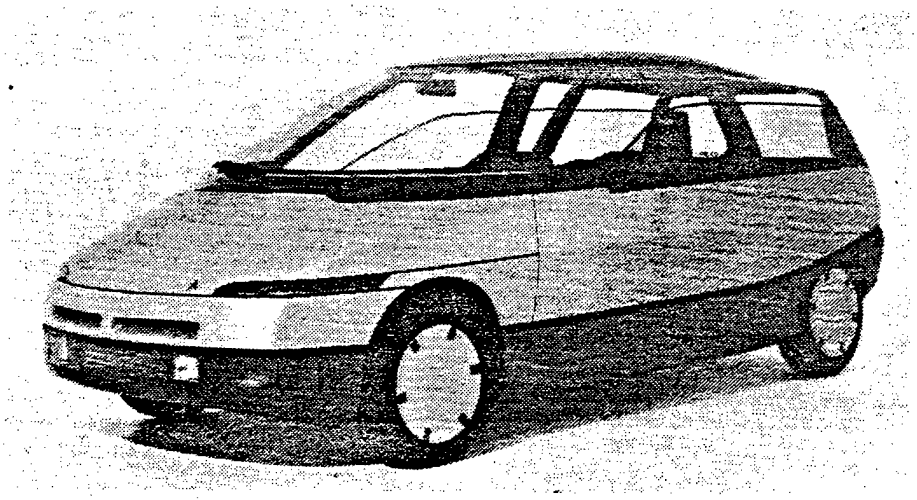
Paris LE FIGARO in French 23 Sep 84 p 8

[Article by J. C.]

[Text] Here comes the small Citroen of the 1990's: the ECO 2000 is already the car of tomorrow. Using all their automobile experience, the researchers had a free hand in dreaming up a car that consumes three liters per hundred kilometers, carries four people and their luggage, and gives a conventional performance. ECO 2000 achieves this goal, but its sophisticated design would prevent it from being sold today for less than 160,000 F. The problem however, is already being studied, and the future small Citroen planned for 1986 will incorporate some of the ECO 2000 findings.

Gasoline at 5.47 F, with 5.87 F expected in the months to come, and maybe soon at 6 F, is a brutal reality which will have the average Frenchman devoting 7000 F to his annual fuel budget. Any effort made to reduce the level of consumption is so welcome, that it is now used for publicity by the manufacturers. And the argument hits home. Consequently, the research program started in 1981 with government aid and expected to yield in 1986 a car that consumes three liters per hundred kilometers, does assume a crucial importance. The future small Citroen will be the first car sold with some of the knowledge gained from this ECO 2000 program.

The ECO 2000 car is probably the most expensive car in the world: 340 million francs--50 percent of them from the government--have been invested in this project, along with the work of about one hundred engineers and technicians. The result is this SL 10, a more graceful and livable version of the SA 109 study prototype. These small Citroens achieve the feat of not using more than an average of 3.5 liters for the three standard consumptions. But this extraordinary figure will be difficult to duplicate on a mass produced car whose manufacturing methods and costs will have little in common with the ECO 2000. However, three approaches (reduced motion resistance, lower weight, and engine optimization) have developed the technology sufficiently to hope



This prototype will be used to design the new "small" Citroen

for an improvement in the energy consumption of our future automobiles. It is useful to know for instance, that a car which consumes 10 liters for 100 km of mixed city-highway driving, needs only 2.5 liters to advance, the remainder being used to overcome air and rolling resistance.

ECO 2000's aerodynamics take advantage of the path recently opened by Audi. Smooth body free of asperities, streamlined undercarriage, airtight cowling, smaller wheel wells, channeling of airflow around the engine, and position correction as a function of speed, add up to a sensational Cx of 0.21, 50 percent lower than the average for today's cars!

Technologic Innovation

Another priority, weight reduction, is translated here in fewer parts. Fabricated from synthetic materials that are still difficult to mass produce, the 85 parts in ECO 2000's structure do the job of the 288 used for the GSA; moving parts and equipment have also been put on the scales, with the gearbox losing one-half of its weight. All in all, ECO 2000 weighs only 480 kg instead of 700 for a car with the same living area.

Lastly, the engine selected is a 750 cc, three-cylinder gasoline model, with built-in electronic ignition. It uses only 3.5 liters, but moves the ECO 2000 at 140 km/h. Acceleration on the other hand is disappointing at 40 s for 1000 m. With its front wheel drive and hydropneumatic suspension, ECO 2000 will soon inspire the small 3.50 m Citroen which will fill the shoes of the irreplaceable 2 CV. A page in the history of the automobile will then have been turned. Peugeot and Renault, with similar projects, will then play their own hands, which should help put France again in the lead of technologic innovation.

Test Drive

Paris LE FIGARO in French 5 Oct 84 p 32

[Article by Jacques Chevalier]

[Text] As smooth as an egg, whose alabaster color and elongated shape it mimics, ECO 2000 is more surprising by the thinness of its very carefully streamlined wheels, than by the daring of its lines. Invited along with several other privileged people to take the wheel on the Citroen test track at Ferte-Vidame, where no reporter had ever entered, I discovered that the "economy hunt" did improve performance. ECO 2000's power had to be reduced to 35 hp so that it would not exceed 140 km/h!

To hear the Citroen technicians, this result stands to reason. If you consider that only 25 percent of the energy consumed by an engine is delivered to the wheels to move the car, you can understand that any effort at limiting power waste will be reflected in better performance. Porsche had already found this out several years ago with the 911, in which consumption improvements had boosted the power from 180 to 210 hp. For ECO 2000, the efficiency improvement has made it possible, for equal performance, to reduce the size of the engine, which is none other than the new Fiat-PSA power plant with one less cylinder.

Near Future

With 704 cc, a carburetor with deceleration cut-off, hemispheric combustion chambers that encourage gas agitation, it still puts out 35 hp at 4750 rpm, and consumes only 3.5 liters for the UTAC (Automobile and Cycle Technical Union) average . It will drop to 3 liters by the end of the research program, expected in 1986, with the adoption of direct injection.

In the size of an R5, ECO 2000 looks like a car of the future, but of a near future judging by the close similarity to the new Opel Kadett design. This style requirement is primordial, since at 120 km/h the hardness of the air represents 71 percent of all the resistance to motion. The outcome is a monocoque silhouette akin to a drop of water with a chopped-off tail end. This appearance, which the stylists with a few tricks, will have to make acceptable to the public, has significant advantages. It creates a particularly pleasant living space and trunk, and pushes the mechanical plant, which is becoming increasingly small, toward the front.

The driver's seat in the ECO 2000 is reached by activating an electric door opener. The light weight of the door is surprising when it closes, and the futurist but comfortable internal decoration is striking in terms of the space created by a very curved windshield ahead of the front seat passengers. The underslung dashboard heightens the sensation of space and visibility, while the instruments naturally use liquid crystals.

Despite its three cylinders, ECO 2000 has practically no vibration and the noise level is pleasant although still being corrected. The small shift lever, located in the dashboard, proves very accessible and easily handled; the gear box has rather short steps, with shifting points reading 40, 65, and 110 km/h. Our mentor during the test admitted that long step boxes are only an interim poor solution, with the new generations of economical cars returning to sounder principles. Without being brilliant, ECO 2000's accelerations are consistent with those expected from a car of this size, the small three cylinder engine demonstrating a very surprising liveliness and willingness through the gears. ECO 2000's light weight certainly helps the quality of the acceleration and braking, with the work in both cases being reduced in proportion to the number of kilograms dropped.

Weighing only 480 kg--66 percent of them in front--ECO 2000 meets all the safety, crash test, rear end collision, and roll-over regulations; it also had to resort to a hydropneumatic suspension in order to balance the payload, which could reach 320 kg. An electric pump independent of the engine supplies one sphere per axle, and a level correction device automatically changes the car's position for the best Cx value.

160,000 Francs

Within the limits of our acquaintance, ECO 2000 seemed very pleasant to drive, with the steering being particularly smooth and direct. Were it to be marketed today, it could not be sold for less than 160,000'F, but the manufacturing engineers are already studying this question. In the next two years, the new small Citroen will owe a great deal to the ECO 2000, but for a more complete technical revolution we will still have to wait five or six years. It seems like tomorrow.

11,023
CSO: 3698/55

AUTOMOBILE INDUSTRY

FIAT, PEUGEOT INTRODUCE 'INTEGRATED ROBOTIZED ENGINE'

CAD Used

Rome IL TEMPO in Italian 19 Sep 84 p 15

/Text/ Turin, 18 September--At the Centro Sicurezza FIAT in Orbassano, near Turin, FIAT has displayed a new engine that will be the first of its kind until the year 2000. It is the first time the introduction of a new engine is covered by the press: however, the exceptional characteristics of the FIRE 1000 deserve to be noted. FIRE 1000 is in fact, the new name assigned to it: the initials stand for Fully Integrated Robotized Engine. This refers to automatic and highly robotized production systems and represents the highest of state of the art levels which insure such high production uniformity as to guarantee high quality levels. "The birth of a new engine," stressed engineer Paolo Scolari, technical director of FIAT Auto, "is a very important event: consider the fact that very few engines are newly produced; in fact, their life is measures in decades."

This is even more so when one considers building a motor of the 1000 class. This is a sector that in recent years has become so important it has reached 23 percent of the total demand of the European market. The history of the project goes back to the year 1980, when FIAT and Peugeot signed an agreement to cooperate in the research and development of a new engine which in matter of weight, dimension and performance would have been far ahead of all others. By the end of July 1981, the first prototype was being bench-tested at the FIAT labs in Turin. Road tests evidenced gas consumption of 27 km to the liter at speeds of 90 km per hour. Because of financial constraints, the French fell behind in the series production phase. In the meantime, FIAT was blazing a trail, culminating in today's display presentation.

In order to plan and produce the FIRE 1000, FIAT Auto invested at least 600 billion lire in the past few years: all this in order to produce a motor which was destined to break many records even before being installed in a car. At the FIAT plant, they really believe this. One of the records: at the Termoli plant, the brand new factory where the FIRE 1000 will be produced, at peak capacity, a new engine will be assembled every 20 seconds, with a total output of 2,500 engines made daily. No other engine manufacturer has been able to match this, but what is more interesting is that despite all this, each single engine will be built with the precision and perfection found usually only in an artisan's handmade work.

However, there are other records, more directly linked to the functional characteristics of the engine: the FIRE 1000 was produced for a specific performance ratio of 80 horsepower to the liter (for the intake version); there is no other full series production engine able to match these results. Actually, the weight to power ratio of the FIRE 1000 (80 horsepower version) is of 0.85 kilos per horsepower. The version shown to us today will also be the first to be used, according to available information, on the new compact made by Autobianchi next spring, the "YIO." In this case, a model with less power was chosen, taking into consideration aerodynamics, weight of the new vehicle and the performance desired: 45 horsepower at 5,000 rpm and 8.2 kilos torque at 2,750 rpm. The engine will also be used by FIAT subcompacts (probably the Uno 45 and the Panda 45), replacing the old 903 cubic centimeter rod and equalizer engine.

In addition, the FIRE 1000, weighing 69 kilos, is the lightest engine in its category, without having to compromise dependability, economy and cast iron noise dampening qualities. Actually, FIAT's new engine owes its light weight above all to the baseplate, which was manufactured making use of an innovative technology.

It also beats every record in its simplicity of construction: the reduction of component parts has actually reached 30 percent. However, there are other goals: the specific design of the combustion chamber, the very high mechanical performance and above all the high optimization of the engine's characteristics as a function of the motor's size have allowed this machine to reach fuel consumption savings unmatched by other engines in the same class.

"In cases involving the same kind of car, excluding performance handicaps, the FIRE 1000" added Engineer Scolari," can consume up to 15 percent less than the 90 cubic centimeter engine, which is already at the top of its category."

Engine Testing

Rome IL TEMPO in Italian 19 Sep 84 p 15

/Text/ The FIRE 1000's cylinder head has been produced with a light alloy, in one piece, and it is completely hollow around the central bloc, which houses the valve springs as well as the inlets for the distribution axis pivots.

The distribution chambers in the cylinder head are formed using the fusion method and the tolerance obtained does not require additional finishing work thanks to a specific verification system. This type of machining allows the formation of identical-sized chambers in the same engine and allows one to maintain chamber size uniformity in all the engines produced.

Among the many cylinder heads tested to come up with the optimal combustion chamber, for the FIRE 1000 engine the so-called "bathtub" chamber was chosen because when compared to others (Heron or May chambers), it provided best swirl thanks to its ample "squish" surfaces.

The care with which the FIRE 1000 was planned and developed is its best guarantee of dependability. One note among the many that deserves attention is that which deals with the regulation of valve play space. The FIRE 1000, because of the materials and the low load levels used, maintains constant the uniformity of clearance space for at least 100,000 km.

Technical Details

Rome IL TEMPO in Italian 19 Sep 84 p 15

/Text/ These are the characteristics of the FIRE 1000: the motor displaces 999 cubic cm (bore and course equalizing 70 x 64.9 mm) with a compression ratio of 10 to 1; four inline cylinders, water cooled, drive shaft with 5 rod supports, drive shaft distribution with built up cam shaft; serrated belt activated with intake and discharge using crossed flux.

In conclusion: "The FIRE 1000 is definitely a new engine, but," as the head of the FIAT public relations office Alberto Nicolello underlined, "we are really not able to say if it was the product of an engine planner or a production systems planner. Up until recently, engines were were created by two separate parents which almost always had to surrender something in the constant search of compromises. The FIRE 1000 on the other hand is borne of two parents, planners and technicians, united decisively by a new phenomenon of our times: electronics.

"The newborn thus has seen the light of day with a totally new characteristic: yes, it's true that one is born every 20 seconds, but it is also very true that every copy of the FIRE 1000 is manufactured as an absolutely perfect produce in all its components just as if it were an engine worked on carefully day after day by one of the best mechanics. This mechanic is totally uniform and precise, and these qualities are mirrored in each of the engine's 273 parts because, concluded the FIAT"s public relations manager, those who invented it, invented it with robots in mind which, given their lack of human errors, never make mistakes."

Planned Production

Rome IL TEMPO in Italian 19 Sep 84 p 15

/Text/ It will be FIAT's Termoli plant to be the first to build the FIRE 1000, in December. The FIRE 1000 is already considered at the head of a new generation of auto engines. Planning and testing the engine cost 30 billion lire, while setting up the production line with the needed means and technologies of the first order increased the total to 600 billion lire. This is proof that FIAT has not neglected to maximize its plant at Termoli. This even is also of signifiance for the whole region, which is the first to build the FIRE 1000. As we mentioned in other pages of this paper, it involves an engine that revolutionizes production and consumption technologies.

To a sophisticated planning technology using automatic and highly robot-dependent systems, (making use, among others, of olographic lasers and structural calculus), one must add a whole series of practical advantages. These include a limited number of engine components as well as a unique weight of less than 70 kilos. Experimental performance tests have yielded excellent results with a fuel consumption of 15 percent less than average engines. The FIRE (Fully Integrated Robotized Engine) in addition, hardly requires any maintenance, and is the result of a long study conducted by FIAT known under the code X 0125.

When production begins, 3 FIRE 1000's will be produced each minute, 2,500 per day. The Termoli plant, equipped with the most sophisticated production machinery needed for the new engine will thus assume, in the local area, a role of relevance and a position of trail blazer. Discussing the expansion of the Termoli plant to accommodate the FIRE 1000, labor unions today will hold meetings with the workers of each shift.

There is no reason not to regard this event as highly significant, above all due to the highest professional levels of the Molise skilled working force which now will be involved personally in a most prestigious undertaking.

9209
CSO: 3698/22

AUTOMOBILE INDUSTRY

NEW TECHNOLOGY AIDS UPSWING IN UK AUTO INDUSTRY

Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German 5 Oct 84 p 2

[Article by Jochen Rudolph: "The British Auto Industry Once Again Builds Confidence: New Technology Is Being Introduced at a Breathtaking Pace/Clear Gains in Productivity"]

[Text] London. In Worcester, the city of cathedrals and sauces, Cosworth Castings Ltd has recently opened a new aluminum foundry for automobile parts which is probably the most modern in the world. Complicated shapes are cast in one piece; in particular, cylinder heads with numerous intake and exhaust ports, channels and passages such as are required for high-performance vehicles. The large automobile manufacturers who have placed orders for castings include Daimler-Benz with an order for cylinder heads for the Mercedes 190 E, 2.3-liter, 16 valves. In Swinden, 1 hour's drive west of London, managers of the big Austin Rover Press Works with evident pride exhibit their system of almost completely computerized design of auto parts. Not only the parts themselves but also the needed tools are designed on the monitor screen and the machine tools which convert these designs into metallic form include computer-controlled laser cutting machines. "Everything comes out of the central data base. Presumably this puts us in the first line of modern production of automobile parts," says the plant manager.

At Lucas Electrical Electronics and Systems in Birmingham the visitor is introduced to an almost endless listing of all the items of electronic equipment which the company manufactures for the most up-to-date automobile generation. In addition to the familiar ladylike voice which brings the driver's attention to all sorts of possible emergencies, this sort of comprehensive system also includes such functions as automatic adjustment of the ignition when there is engine "knocking," the automatic adjustment of the carburetor for minimal fuel consumption while idling or interruption of fuel supply during vehicle delays. This department of the Lucas Company has at the present time when averaged over its various manufactured items a growth rate of 30 percent annually.

Modern equipment and manufacturing processes, a large demand for sophisticated new products and also the feeling of full participation in a major transformation have restored to the British auto industry and its suppliers a great part of that confidence which they had so profoundly lost during the dreary sixties

and seventies--the period of decline and hopelessness. Since then productivity has enormously increased: at Austin Rover, the most important branch of BL (British Leyland), at that time one man produced only four passenger cars per year. Today he produces 14 and the company management is aiming for 20. At Vauxhall Motors, the sister company of Opel, 60 working hours were once required to assemble a car; today 30 hours suffice--and these cars contain more than they did 10 years ago.

Productivity has increased partly in consequence of circumstances which permitted a reduction in labor troubles, and partly in consequence of new technology, especially in transfer production lines and in the use of robots. The threat of unemployment has contributed to the relatively stable state of labor tranquility. Many tens of thousands of workers, especially those in the low-skill class, were let go in the years of the recession. Labor peace has also been promoted by new forms of compensation, usually consisting of a mixture of prescribed day work and extra pay. Such a system means that there is little occasion for dispute over the work accomplished and the causes of inefficiency. At the same time such forms of stimulus as bonuses and wage incentives have been maintained. But for how long will this relative peace be preserved?

In a conversation between foreign journalists and leading figures of the British automobile industry it has been clear that scarcely anyone expects an enduring peace. In recent weeks there have once again been strikes in various plants, especially at Austin Rover, the passenger car plant of BL, and at Vauxhall Motors, the subsidiary of General Motors. To a certain degree the situation is being kept in hand, thanks to large investments which make better wages possible and thanks to a policy of continuously educating the workers regarding factory activity and not least of all thanks to educational facilities in the plant which can help employees to improve the chances of their social betterment. But there is still a lot which lies beyond the range of such measures and the automobile bosses freely admit: "We don't know what the future will bring."

For the moment the strike statistics look substantially better than they did in the seventies and even at the beginning of the eighties. The Association of the British Automobile Industry and Automobile Trade has calculated that each automobile worker in 1981 lost 7 days as a result of labor disputes but fewer than 2 days in 1983 and even fewer than that in the current year. The association speaks of a "many-sided improvement in practical labor relations."

Also new facilities, machines and techniques have contributed substantially to the higher productivity: "New technology was one of the factors which rescued Austin Rover," declares Harold Musgrove, the boss of this big branch of BL, "and this new technology is just as good as the Japanese." In some areas of automobile manufacturing the British even feel that they are already superior to the foreign competition. Professor Kumar Bhattacharyya, professor of production-technical systems at the University of Warwick, evidently has very clear ideas on this point: "We are ahead of the Germans in the use of computers, especially in design and in work layout, in the use of flexible production systems and generally in the use of new machines and facilities."

He attributes this primarily to the large production of computer software in England where an enormous number of smaller companies are engaged in such production. In this area, too, he considers that the Japanese have not kept up with the British. The professor has nothing but praise for the fact that in British schools the children and young people are familiarized with computers. He reported that Austin Rover "has this year employed 150 university graduates" and he mentioned the great interest in minicomputer courses in enterprises of the British auto industry. With regard to technical innovation he said: "The pace at which new technology is being introduced into the British car industry is breathtaking. In some areas it is faster than anywhere else in the world." Notable also is his statement that "the Germans are becoming more and more aware of their technical rigidity."

On the other hand this scientific guru of British engineering technology recognizes German strengths: "They have better management, better salespeople and they have good relations with their employees." The boss of Jaguar Motors, John Egan, famous for his great successes in changing Jaguar production over to quality and profit, struck the same note on this occasion: "German management is very good and the German workers set themselves high standards of quality." Despite their newly won confidence the British auto industry and its supplier industries are not unreservedly happy about the present situation. In the first 8 months of this year the sales of passenger cars in England came to 1.29 million units and this was 4.1 percent lower than in the same period last year--although it must be admitted that during that time record-breaking figures were attained. British automobile production at a figure of 685,000 units was 8 percent lower than in the comparable period of the previous year. The imported vehicle fraction has for a long time been about 56 percent. In addition to the effects of the reemergence of labor disputes the business has also been impaired by problems in the European export of passenger cars. In the first 8 months the production of commercial vehicles was 4 percent lower than in the same period of the previous year while new licensings increased by 2.4 percent.

At the present time the British automobile industry is trying to elicit a couple of fiscal concessions from the minister of finance. They especially want him to drop the additional sales tax of 10 percent on passenger cars. The industry believes that with the help of such alleviations the British market could expand to 2 million passenger cars--the previously highest licensing figure in 1 year was 1.79 million. By this means it would be possible to compensate for a substantial portion of the tax loss. At the present time England has 285 passenger cars per 1,000 inhabitants as compared with 400 in the FRG.

8008
CSO: 3698/49

AUTOMOBILE INDUSTRY

BRIEFS

RESCUE EFFORT FOR VAN DOORNE'S--The Hague, November 7--Van Doorne's Transmissie (VDT) faces almost certain liquidation unless shareholders agree to pump more money into the Tilburg-based firm, Economics Minister Gijs van Aardenne said today. He told the standing second chamber economic affairs committee the firm could be saved of shareholders agreed to cooperate. It has been struggling for years to start mass production of a continuous-shift transmission system it developed and which won the interest of some major motorcar companies, including Ford. Van Aardenne said the Dutch government was very much interested in keeping the expertise developed with the 'variomatic' transmission in Holland. But he refused to say publicly how the government could prevent third parties from taking over production on the transmission. Van Aardenne said he was willing to serve as a mediator in talks between Van Doorne's and its creditors and shareholders. Van Doorne's management said earlier this week that the Nationale Intereringsbank and the Amsterdam-Rotterdam Bank (Armo) had also blocked access to the company's current account. The Dutch economics ministry said on Tuesday that one of its top officials would go to the United States next week to keep shareholder Borg-Wagner from withdrawing its support from Van Doorne's. Borg-Warner has a 24 per cent stake in VDT. Other shareholders are Volvo Car 39.5 per cent, Fiat 24 per cent and the Dutch state 12.5 per cent. [Text] [The Hague ANP NEWS BULLETIN in English 8 Nov 84 p 3]

CSO: 3698/105

BELAIRBUS TO MANUFACTURE PARTS OF AIRBUS A-320

Antwerp LLOYD ANVERSOIS in French 13-14 July 84 pp 1, 3

[Article by Y. Verbraeck: "The CMCES Approved Belgium's Participation In the Airbus A 320 and CFM 56-4 Projects"]

> [Excerpts] The CMCES [Ministerial Committee for Economic and Social Coordination] has approved Belgium's participation in the Airbus A 320 and CFM 56-4 projects.

Thus, as proposed by Mr Maystadt, minister of budget and scientific policy, the CMCES decided to grant SONACA [expansion unknown] N.V. Asco and N.V. Watteeuw a repayable advance of BF 1.1 billion to cover research and development expenditures in relation with Belgium's participation in the international Airbus A 320 project.

The first A 320 should be on the assembly line early in 1986, make its first flight early in 1987 and be delivered to the first clients early in 1988.

Early in March 1984, the French, West German, British and Spanish governments approved the launching of the A 320 program.

The production workload distribution which was then agreed on was as follows:

- wings: British Aerospace (25.26 percent);
- fuselage forward section and final assembly: Aerospatiale (33.36 percent);
- fuselage center and rear sections and inside upholstering: Messerschmitt-Boelkow-Blohm (31.61 percent);
- rear ailerons: CASA [Spanish Aeronautical Engineering Company] (5.24 percent);
- tasks not yet allocated (1.58 percent).

The tasks assigned to Belgium (Belairbus) represent approximately 2 percent, to be subcontracted by British Aerospace, and involve wing slats and associated mechanisms, i.e. tracks, racks and pinions.

In the industrial planning of the A 310, the slats were made by SONACA and the tracks by Asco. The manufacturers involved are proposing to retain

the same planning. The technical and industrial performance to date of these two companies has been judged quite satisfactory by Airbus Industrie.

Compared with the A 310, the A 320 mechanisms will involve a new task, namely the driving racks and pinions, which are also entrusted to Belgium.

After analyzing Belgium's technical capabilities in this respect, the manufacturers involved proposed to entrust the task to the Watteeuw Mechanical Engineering Company of Bruges.

As a result, the industrial planning proposed by the three firms is the following:

- SONACA will be the prime contractor for the W 320 project as a whole and will manufacture the slats (and the tools to produce them) as for the A 310;

- Asco will operate as a subcontractor for SONACA to manufacture the tracks (and the tools to produce them) and will be in charge of the tracks-racks assembly;

- the Watteeuw Mechanical Engineering Company will manufacture the racks and pinions, and the tools to produce them, as a subcontractor for Asco and under SONACA's technical supervision.

In workhours and sales, the breakdown among the three firms will be as follows:

Breakdown	A 320 Workhours	A 320 Sales
Total	approx. 280,000 hours/year	approx. BF 850 million/year
SONACA	65 percent	48 percent
Asco Watteeuw	35 percent	52 percent

The cost of research and development for this contract, i.e. BF 1.1 billion, will be advanced by the state and distributed 90 percent to SONACA and 10 percent to Asco and Watteeuw.

Expenditures related to the financing of the training curve and the prefinancing of production fall within the competence of regional executives.

The distribution of shares within Belairbus (the Belgian company whose object is to manage the Belgian participation in the Airbus project) will be revised to reflect the projected industrial planning. The three regions could acquire shares in Belairbus.

The CFM-International consortium decided to manufacture a new version of the CFM 56, the model 4.

The Herstal National Manufacturing Company negotiated the acquisition of 10 percent of SNECMA's [National Aircraft-Engine Study and Manufacturing Company] interest, i.e. 5 percent of the project as a whole.

This interest represents a total cost of BF 1.966 billion over a 10-year period.

A 5-percent interest in the project will give Herstal the right to contribute 5 percent of production and receive 5 percent of the receipts after deduction of the overall marketing and warranty expenses and after-sale service costs.

A profitability study based on a very conservative estimate (1,700 engines sold instead of 2,500 as projected by the consortium, i.e. 68 percent of projections) revealed a positive cash flow starting at the end of 1989 (1-1/2 year after the first delivery) and reimbursement in full of all launching expenditures around June 1991.

Sales to be made by Herstal throughout the production period, i.e. from 1987 to the year 2000, will amount to approximately BF 15 billion in constant francs. During the peak period (1987-1991), 350 people will be working on the project. Then, the number of jobs will decline to 100 by 1998.

This program, plus Herstal's participation in the PW-4000 engine project now being negotiated, will provide the Herstal Engine Division with the diversification it needs. It will considerably reduce its dependence on military orders.

However, the firm is unable to finance alone the risk which participation in such international projects represents.

Therefore, following a proposition from the minister of scientific policy, Mr Philippe Maystadt, the CMCES decided to grant the Herstal National Manufacturing Company a repayable advance of BF 695 million, i.e. 100 percent of the research and development expenditures and 35.3 percent of the total cost.

9294
CSO: 3698/106

ATR 42 ASSEMBLY LINE AUTOMATION DESCRIBED

Paris REVUE AEROSPATIALE in English Nov 84 pp 6-8

[Text]

Conceived after lengthy concerted discussions between the ATR42 partners, Aeritalia and Aero spatiale, and efficient teamwork by the respective design departments, the ATR42 assembly line now set up at the Toulouse facility has benefited from experience gained from assembly of the Airbus. The broad principles which guided the engineers in defining its infrastructure were these : optimized assembly and testing times, automated workstations and adaptability of the tooling.

As is well known, the assembly line is a decisive factor in manufacturing costs and production cycles, making it necessary to design and produce all the tooling (jigs, test-stands, etc.) needed to assemble the new regional transport aircraft in the most cost-effective way and with maximum flexibility, and this has been successfully accomplished. The landing-gear tests, for example, are carried out at one of the workstations (station 22) with the aircraft supported on jacks. But in order to provide for a possible forward move ot station 24, steps were taken from the outset of the design of the latter to have elevating devices on the feet supporting the mobile work platforms so as to enable the tests to be carried out with a configuration similar to that for station 22.

At each station the mobile work platforms are carried on a portion fixed to the ground. The framework is made of steel extrusions with wooden floors surrounded by protective guard-rails. Having an area of about 200m2 (2153 sq. ft) each (with the exception of station 45-7), they are 1.25m (4.10 ft) above the floor when the aircraft is supported on its wheels and 1.90m (6.23 ft) when it is resting on the stands.

Workstation automation

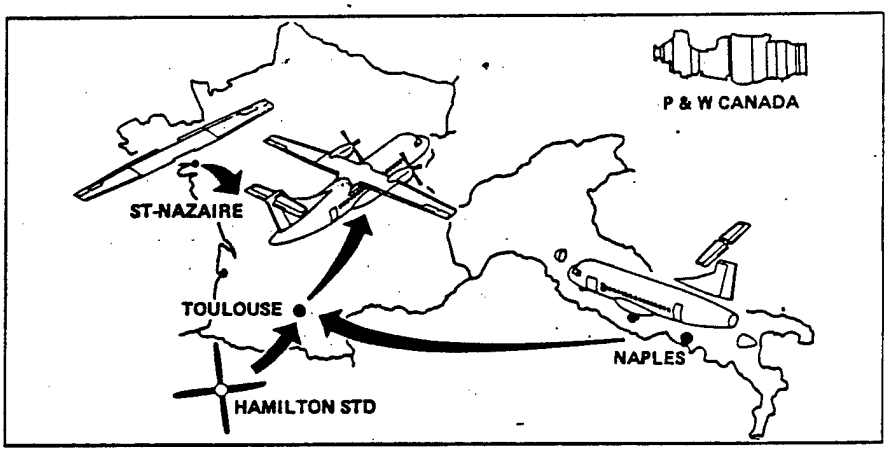
The automated workstations are the novel feature of the assembly line. The trickier operations, and the motions of the platforms as they hug the aircraft on either side of the fuselage, are fully automated, with a programmable automaton providing overall control from a console. Examples of such operations include wing/fuselage mating, landing-gear tests and the motions of the robot platforms at these workstations as the aircraft moves forward, the posts and the jacks being mechanically synchronized.

During line rotations, the four elements of the platforms (except for station 23) are moved by high-efficiency electric motors (to save energy and minimize costs).

It should be noted that rotations on the ATR42 line are carried out in half the time it takes on the Airbus line, with half an hour sufficing for a line move.

This optimized conception of the assembly line will thus make it easy to move from the basic version to a stretched version, and above all to schedule the tasks according to changing production rates.

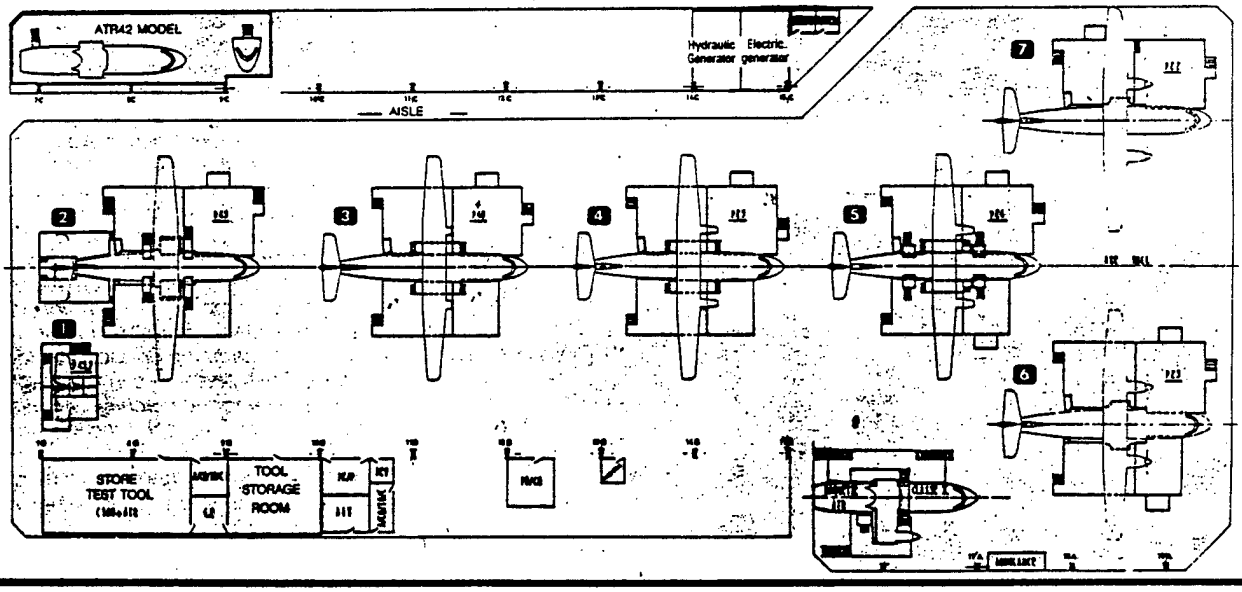
Although it is operational, the assembly line has not of course yet reached the normal production rate. The latter will attain two aircraft per month in one year's time, rising to four per month in 1986 and possibly to six in order to satisfy customers who are in a greater hurry.



Assuming a production rate of four aircraft per month, the number of workstations on the assembly line has been fixed at seven.

1. *Station 45/7 : assembly of the horizontal and vertical tail surfaces produced by Aeritalia.*
2. *Station 45 : mating the wing to the fuselage (already equipped with the landing-gear) ; fitting the tail unit and the rear cone ; installation of electrical equipment in the cabin and the cockpit.*
3. *Station 40 : installation of instrument panel equipment and adjusting the flight controls.*
4. *Station 25 : electrical circuit tests.*
5. *Station 24 : functional tests (flight controls, autopilot, navigation) ; in parallel with this workstation : equipment of the engines and propellers.*
6. *Station 23 : further functional tests and installation of engines and propellers.*
7. *Station 22 : final tests (pressure regulation, landing-gear, hydraulic circuits, etc.) ; installation of pilot and copilot seats.*

The cabin furnishings will be installed off the assembly line prior to delivery to customers.



Weight reduction, low fuel consumption, meeting production schedules... These are all important factors in the commercial success of an aircraft. And both manufacturers - Aerospatiale and Aeritalia - have naturally deployed their immense industrial resources to ensure that production proceeds wthout a hitch and lead times are cut to a minimum.

Datum values

In the matter of aerodynamics, wing design is what Aerospatiale has focused on most. Indeed, the central box structure, built entirely at Saint-Nazaire, employs sophisticated production methods.

In the wing, which consists of a central rectangular box spar and two outboard wing sections, the load-absorbing element is a two-web stressed box member that provides the fuel tanks in the area between the fuselage and the wing roots. Needless to say, datum values exist for the central box spar the accuracy and interdependence of which must be scrupulously observed. And to ensure this the Saint-Nazaire works have set up a highly sophisticated machining center of entirely new design.

The structure of the box member utilizes machined panels for the top and bottom skins. Once assembled, this box member is mounted, with due account for the flight reference values, on an extremely rigid jig that carries the various machines for machining the wing/fuselage attachment fittings, the engine mounts, the flap hinge attachments and the wing root attachments.

At this stage of manufacture, machining circumvents to a certain extent the distortion phenomena inherent in assembly. It also guarantees relational accuracy in the various elements that peform the aircraft's main aerodynamic functions.

Innovative engineering, extreme care and determination in the quest for effective solutions have produced a unit that has enabled the design engineers to meet the requirements of quality assurance, cost-effeciveness and production schedules. Working conditions have also been improved, of course.

All this has naturally been accomplished by recourse to modern techniques like numerical control for displacing the machining-heads, and hydraulic and pneumatic power to minimize the bulk of units required to operate in places where access is particularly difficult.

Avant-Garde

Wing/fuselage mating is one of the principal difficulties to be resolved. After machining, the steel bushings mounted on the attachment ball-joints had to be spot-stamped 'on the fly' (see photo), and no established procedure for doing this existed as yet. Innovation was therefore needed.

As one engineer explained, "*We were able to develop a highly original spot-stamping method. This consists in spot-stamping an interposed stainless steel ring which ensures that the ball-joint cage is securely fixed in its housing. This is accomplished by means of a hydraulic ram which thrusts the ring against a motor-driven roller whose rotation ensures a perfectly uniform operation. Spot-stamping on the two sides of the ball-joint is performed in two stages by merely inverting the machine. All this has resulted in substantial time-saving and greater precision.*"

This machining method is still unique in Europe but will certainly find other applications as well.

CSO: 3698/130

BRIEFS

FRG'S AIRBUS EXPECTATIONS DETERIORATING--Losses. News from Munich is not always cause for joy in the capital--and this is true every time for Airbus, Bonn's most favorite, and above all else, most expensive industrial project. The rejoicing at the German Airbus partner's in Munich over the leasing, purchase and option agreement for a total of 21 of the European civilian jets to U.S. airline Pan Am had not even died away when those responsible for the Airbus in the Bonn ministries developed stomach pains. The reason: because of the poor market situation Airbus Industries offered to sell its jets from the stockpile at ridiculously low prices. Insiders are grumbling about a price reduction of about 50 percent. The consequence for Bonn and the budget: chances of ever getting out of the red with the Airbus program are moving toward zero. According to the previous corporate statement, the accumulated losses were to be eliminated by 1994 from the sale of 860 Type A 300 and A 310 aircraft. According to the most recent figures the Federal Government is going to have to get used to the idea that for the billions in guarantees with which it supported the financing of production it will have to help out with tax money. [Text] [Duesseldorf WIRTSCHAFTSWOCHE in German 19 Oct 84 p 22] 12124

CSO: 3698/76

'ESPRIT' PROGRAM CONTINUES TO FOSTER EUROPEAN COOPERATION

Bonn DIE WELT in German 19 Oct 84 p 13

[Article by H. Hildebrandt: "500 Projects Are Being Tackled"]

[Text] Whereas opposing points of view among the individual member countries with respect to EC agricultural policy constantly make headlines, the cooperation in the industrial sector which is showing increasing improvement is scarcely noticed by a broad segment of the public. This is also true of the "European Strategic Program in Research and Development of Information Technology," succinctly and ingeniously called the Esprit program.

Since spring 1982, 12 leading European computer science enterprises have been cooperating under the auspices of the EC in the context of this project. Their declared objective is to expand European capabilities in order to decisively improve competitiveness in the world market and not to leave it just in the hands of the competitors, say from Japan and the United States.

The German members of this group are the AEG [General Electric Company], Nixdorf and Siemens. Additionally, there are, for example, ICL and Plessey from Great Britain, Bull from France, Olivetti from Italy and Philips from the Netherlands. The names in themselves guarantee that we are not dealing with plans based on theoretical considerations.

The first projects with a pilot function are in progress, involving approximately 300 experts from the member firms. For the present the Esprit contract has a term of 10 years; for the first 5-year phase there is a budget of 1.5 billion Ecus [European Currency Units], half of which is EC funds and half contributions by the members.

The background of the cooperation is in large part the discovery that competitiveness of the European computer science industry can no longer be sustained by competing enterprises going it alone. Thus, for example, in the FRG, France and Great Britain the current annual production value of integrated circuits, a key product of computer and communications technology, is far below that of Texas Instruments, the largest U.S. manufacturer. Even in the application sectors there are large gaps. The share of computer-controlled machine tools, and even more so of robots, is substantially higher in the United States and Japan than in Europe.

On the other hand there are definitely reasons for European optimism. Not only scientific accomplishments, justify this claim, although cooperation between universities and industry in Europe is urgently in need of improvement. In technical subsectors Europe is likewise ahead; in this regard, as examples, mention can be made not only of optical conductors, but also all telecommunications as well as the vehicle industry and broad sectors of space technology.

Moreover, in software engineering, the production of specific user programs in the EDP sector, Europe is absolutely in the lead.

Building on these conditions the Esprit program is tackling the following key tasks:

1. Microelectronics. Making microprocessors smaller with more elements on a chip with simultaneously lower energy requirements. The objective is to reduce the extensive dependence on U.S. suppliers.

2. Software technology. Continued expansion of Europe's leading position.

3. Information processing. Expansion of data banks to knowledge banks, for example in medicine. Thus, organizing artificial intelligence toward the combination of man and machine.

4. Office systems. The objectives are open systems which do not involve automating existing procedures but rather converting methods to completely new systems.

5. CIM. Computer-integrated manufacturing.

Standardization, total control of a machine by a chip. Networking of integrated systems.

As a preliminary stage for this ambitious plan it was possible to establish an information exchange system called Eurocom which published more than 20,000 communications for approximately 300 interested customers. Upon completion of pilot projects phase, about 500 concrete project will begin, starting in 1985. Those in the telecommunications sector are to receive the blessing of the EC Council of Ministers next week.

Dr Jean-Marie Cadiou, director of Esprit headquartered in Brussels, recently said at a seminar put on by Nixdorf: "Let us make a joint effort, we are under pressure. Not only are six percent of all workers in Europe involved in computer science, it also has quite a substantial influence on at least two-thirds of all industry." However, pressure exists to a large extent because in the meantime seven of the leading Japanese manufacturers in the industry have decided on similar cooperation in the context of their "5th generation."

12124
CSO: 3698/77

BRIEFS

FLEXIBLE ELECTRICAL DISCHARGE MACHINING--Amchem (England) has delivered to a contractor of the Department of Defense of the United States, an automated electrical erosion cell. It consists of an electrical erosion machine, a carrousel for storing parts (up to 80) and 40 electrodes, a robot, and an NC (numerical control) system. The cell can thus work without an operator for 3-4 days. Some machined parts (300 mm x 50 mm) have 28 cavities and require eight different electrodes. The cell is designed for attaching a second electrical erosion machine (already ordered). The plan is to build up to four machines. [Text] [Paris INDUSTRIES & TECHNIQUES in French 20 Sep 84 p 9] 11,023

CSO: 3698/89

GALLIUM ARSENIDE COMPOUNDS TESTED NONDESTRUCTIVELY WITH X-RAYS

Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German
8 Oct 84 p 7

[Article: "X-Ray Diffraction for Quality Measurement: Philips Obtains Even Higher Precision/Nondestructive Testing"]

[Text] re. Frankfurt. In the Philips Research Laboratory in Eindhoven (Netherlands) a measuring device has been built with which it is possible, using X-ray diffraction, to measure very accurately small deviations in the periodicity of monocrystals, according to a Philips report. It is the aim of these measurements to examine changes produced deliberately, for example, in multilayer structures of gallium arsenide compounds. Amongst other uses, such structures are employed in manufacturing laser diodes. For these investigations one requires very narrow and monochromatic X-ray beams. According to the report such beams are obtained by reflecting X-ray radiation in a special manner at perfect monocrystals.

Using substances such as silicon and gallium arsenide, it is possible today to manufacture monocrystals exhibiting a very high level of perfection. It is found that in the diffraction of X-ray beams at these crystals there occur very sharp peaks of intensity (with a half-width of only 2 arc seconds). Therefore it is possible to measure displacements of these peaks which occur as a result of small departures from uniformity--in consequence of intentionally introduced changes in the composition of the material. For such measurements one requires radiation bundles having less than one-thousandth of a degree of deviation from parallelism and having very small line breadth (about 10 times less than that of the characteristic radiation of the elements). At the same time the intensity of the radiation beam must be sufficiently high so that one can make a measurement within a reasonably short period of time.

As Philips further reports, for this purpose one could avail oneself of the above-mentioned possibility of manufacturing perfect monocrystals. One obtains a radiation beam having the required characteristics by reflecting the radiation beam emerging from an X-ray diffraction tube four times at the crystal planes of two monocrystal blocks, thus selecting a diffraction angle alternately to the right and to the left. According to information from Philips the perfection required in the final processing of the germanium blocks is less than the stated conditions would lead one to expect, because the

reflections occur at atomic planes within the material and not at the visible external surfaces. With the described setup, which was designed by W. J. Bartels, a colleague in the Philips Research Laboratory in Eindhoven, it is possible to measure changes in the periodicity of a monocrystal with an accuracy of one-millionth of a nanometer.

One application of this measuring procedure is the analysis of multilayer structures of gallium-aluminum-arsenic compounds on a gallium arsenide substrate. Here X-ray diffraction is so advantageous because it makes it possible to nondestructibly examine structures out of which laser diodes are to be manufactured--for example, for compact disk record players.

8008
CSO: 3698/49

PHILIPS EXECUTIVE ON 'MEGAPROJECT'

The Hague ANP NEWS BULLETIN in English 8 Nov 84 p 5

[Text]

E i n d h o v e n, November 7 - Philips plans to invest some five billion guilders in the development and production of microchips over the next five years, executive board member R. Spinosa Cattela said today.

In the same period the Dutch electronics concern aims to increase annual sales of microchips to 8.5 billion guilders from about 3.5 billion guilders this year, he said.

Spinosa Cattela was speaking to newsmen after Philips announced third quarter profits of 241 million guilders, up from 103 million in the third 1983 quarter on the basis of current cost accounting.

Philips was optimistic that profits will continue to grow in 1985 although growth is expected to be less spectacular than in 1984, he said.

In a newspaper interview published tonight another Philips executive board member Dr. S. van Houten said the investment plans reflected the 'strategic importance' of the microchip.

Van Houten told NRC Handelsblad that the microchip now formed the heart of almost all of the group's products from colour television sets to electronic medical equipment.

U.S. Partner Wanted

Van Houten predicted that the microchip's importance within the electronics industry would continue to grow. 'A company which can not keep pace with this development has no chance', he told NRC Handelsblad.

The sum of five billion guilders represented roughly a quarter of Philips' total investment for the five-year period, he said.

In October Philips and Siemens of West Germany announced plans to invest 1.5 billion guilders in the next five years in a joint project to develop a 'superchip' far more powerful than chips now available.

Spinosa Cattela told journalists that Philips was still looking for a potential U.S. partner for the Polygram recording company which is owned jointly by Philips and Siemens.

The U.S. Federal Trade Commission objected to a planned merger between Polygram and Warner Communications' recordings division on the grounds that the resulting concern would be too powerful.

Spinosa Cattela also called for further import restrictions on Japanese video equipment.

Estimates of total European sales of video equipment had been too optimistic, he said.

CSO: 3698/105

BRIEFS

NETHERLANDS-CHINA AGREEMENT--Philips just signed a licensing agreement with the Chinese Dan Dong company under which some of the electronics giant's line of X-ray diffraction equipment will be produced in the People's Republic of China, an official of the Eindhoven company announced Thursday. At a press conference in Mierlo, near Eindhoven (southeastern Netherlands), Mr P.A. Van Dalen, manager of the Philips Scientific and Industrial Equipment Division, indicated that this agreement would enable the Dutch multinational company to strengthen its position on the Chinese market. Mr Van Dalen pointed out that Philips had managed to gain recognition as the leading European manufacturer of analytical instruments. "However," he added, "a concerted efforts in other countries has resulted in a similar growth in the United States and in the Far East--Japan included--which we see as a key territory for expansion." [Text] [Paris AFP SCIENCES in French 4 Oct 84 p 43] 9294

NEW FRENCH TRANSISTOR--The integration of the TBDH (double heterojunction transistor) transistor--mesa technology gallium arsenide (GaAs) on a semi-insulating substrate--has allowed CNET (National Center for Telecommunication Studies) to produce inverters whose propagation time should be 300 ps (characterization is underway). The transistors have a gain of the order of 50, and the emitter-base and base-collector capacitances are lower than 0.4 pF. This ECL (emitter-coupled logic) GaAs approach can provide a factor of merit which should reach 70 fJ. [Text] [Paris INTER ELECTRONIQUE in French 17 Sep 84 p 36] 11,023

FRENCH VHSIC PROGRAM--The French industry is not absent from this race, which will eventually determine the performance of our future weapons systems, and consequently our position on the international weapons market. Last July, the General Delegation for Weapons (DGA) launched the VHSIC (very high speed integrated circuits) program. Based on technologies being developed by Thomson-Semiconducteurs and Matra Harris, this plan should result in 87/88 in the fabrication of 1.5 micron-line C-MOS and bipolar circuits. The ultimate goal is to achieve the capability to produce highly integrated and very fast digital computer components. The allocations are of the order of 500 MF (million francs) (250 MF for DGA and 250 MF for industry). [Excerpt] [Paris INTER ELECTRONIQUE in French 17 Sep 84 p 7] 11,023

CSO: 3698/88

SCIENTIFIC AND INDUSTRIAL POLICY

PHILIPS, SIEMENS STAKE MILLIONS ON 'MEGA-PROJECT'

Funds, Researchers Allocated

Rotterdam NRC HANDELSBLAD in Dutch 11 Oct 84 pp 1,13

[Article by Dick Wittenberg: "Philips Invests Millions in Chips"]

[Text] Eindhoven, 11 October -- Philips is going to invest billions in the development and production of a new generation of chips.

Of this, 1.5 billion guilders have been earmarked for the so-called Mega-project, a cooperative venture between Philips and the West German Siemens company for the development of submicron technology for the further reduction of integrated circuits [IC]. Philips refused to publish the total amount of the investment.

The research is expected to lead within 5 years to the production in Nijmegen and Hamburg of extremely complex types of chips. It involves chips with an enormous memory capacity. Such a chip will hold 4 to 5 million circuits in less than a square centimeter.

For the Mega-project, Philips and Siemens will each provide 500 million guilders. The German Ministry for Research and Technology will add DM 300 million. The Dutch Ministry of Economic Affairs will support the project until 1990 with a maximum of 190 million guilders. In addition, Philips can count on investment subsidies up to 20 to 30 million guilders.

Supervision over the spending of the subsidy will be carried out by a committee formed by engineer P.M. de Wilde, professor of electro-technology and network theory at the Delft Technical College, Dr. J. Middelhoek, special professor of IC technology at the Twente Technical College, and engineer C. Le Pair, director of the Technical Sciences Foundation in Utrecht.

Research concerning the new chips will be carried out by Siemens in Munich and Hamburg. Philips will build a special IC center in combination with a test plant at the Physical Laboratory in Eindhoven. In addition, there will be a center for designing chips and developing adapted computer tools. These two investments involve 400 million guilders.

It has been estimated that at its peak a total of 525 people will be working on the Mega-project. Philips plans to attract approximately 200 new employees. No decision has been made as yet about mass production of the new chips. However, blueprints are ready for the expansion in 1987 of the chip plants in Nijmegen and Hamburg (Siemens).

Mr F. Rauwenhoff (engineer), president of the general management of the Philips enterprises in the Netherlands, calls this cooperation "crucial for Europe and the Netherlands."

Non-vital parts of the research will be assigned to universities and technical colleges.

The union organizations are particularly pleased with the announcement that in the coming years Philips will invest billions of guilders in the development and production of a new generation of chips. A. van der Veen, of the industrial union FNV [Netherlands Trade Unions Federation], finds it "great that such a development will be taking place in the Netherlands." "The climate in the Netherlands is evidently so favorable that people are once again willing to invest in the future here on a large scale."

Project Goals

Rotterdam NRC HANDELSBLAD in Dutch 11 Oct 84 p 13

[Article by Dick Wittenberg: "Cooperation Between Philips and Siemens a 'Logical Step'"]

[Text] Eindhoven, 11 October -- "We have done exceedingly well in recent years in the area of chips. This year, the world market for chips will grow by roughly 50 percent to reach about $20 billion. We have even managed to broaden our market share."

Dr Theo Holtwijk -- his visiting card says manager "Plans and Projects Integrated Circuits of Philips Internationals" -- leaned back with satisfaction in the De Cocagne Hotel in Eindhoven. He looked pleased that his words made an impression on his guest. Theo Holtwijk is outwardly a confirmed Philips man, even in the way he dresses. He wears an innovator tie, specially designed because the Innovator ship, sponsored by Philips, is going to sail the world seas. His breast pocket is adorned with three blue letters: ICS.

Cold figures underline Dr Holtwijk's optimism. In 1981, Philips sold 1.5 billion guilders worth of chips. This year sales will amount to nearly 4 billion guilders. Philips and its American subsidiary Signetics are among the five largest chip producers in the world. The Dutch electronics corporation would like to keep that position. Preferably even improve it. Therefore the board of directors has decided to intensify and accelerate the development of a new generation of chips.

Philips assumes that it will be possible to start production of chips with a track width of 0.7 micron (7 ten thousandths of a millimeter) by the end of

1988 or the beginning of 1989. That means a reduction of the structure of the chip by a factor of 4. "We have set our goals rather aggressively," said Holtwijk with a sense of understatement.

Dust

He explained that one encounters enormous problems with the further miniaturization of chips. Up to now the dimensions could be reduced with the aid of better equipment and better materials. The principle of the production process did not change all that much. But if you want to reduce the dimensions even further then you can no longer make do with current technology.

The physical characteristics of transistors change and complications develop in the manufacturing process. Hence, a completely new submicron technology must be developed for this. Production areas will also have to be adapted to even more stringent demands, said Dr Holtwijk, "certain steps in the manufacturing will be completely automated because man will no longer be tolerated there. After all, man remains the greatest source of dust. In addition, you need a supercomputer and related programs to be able to design and simulate such complex integrated circuits."

Perhaps Philips would have preferred to spread the gigantic efforts the corporation will face during the next 5 years over a somewhat longer period of time. "But we have no choice," admitted Dr Holtwijk. "The total development in the world pushes us. Such enormous amounts of talent and capital are being dragged into the IC industry. If we want to strengthen our position we will have to put an extra scoop on top of that."

Strategic Importance

A further reduction of the chip structure will reduce the cost price per function even further. Consequently, the field of application of integrated circuits will grow further once again. Still, Philips is not putting so much money and energy into chips solely because it involves a tempting growth market."

Dr Holtwijk feels that the strategic importance of submicron technology is more significant. He is convinced that such an advanced miniaturization technique will also find applications in other fields. He noted that an invention such as the compact disc was possible only thanks to IC technology. "They copied the way to make compact discs from the chip factories," noted Holtwijk.

Furthermore, there is the fact that the application of memories in electronic equipment from Philips is expected to expand enormously in the coming years. This is also one of the reasons to try to eliminate as quickly as possible Philips' lag in this area behind the Japanese. Dr Holtwijk further emphasized that Philips does not lag behind the competition over the whole line of chip activity." In some areas it is precisely the Japanese who are clearly behind. In some fields they don't count for anything."

According to the Philips manager it was in the nature of things to steer toward cooperation in the development of new generation chips. "It is simply a fact that two have a greater potential for knowledge at their disposal," said Dr Holtwijk soberly. "Furthermore, you have the opportunity to take several roads. This makes the likelihood that you will succeed substantially greater. It also costs less and goes faster when two companies cooperate on a single project."

According to Holtwijk it was no more than logical for Philips to end up with Siemens. Both enterprises have already been cooperating in the area of basic research since the end of 1982. The two corporations also know each other well. They have all kinds of interests in the Polygram record company. Furthermore, there are several "second source" agreements in the field of chips, which means that they manufacture one another's products. And as if all that were not enough, Philips and Siemens are also unquestionably the two largest chip producers in Europe. But the most important argument was the fact that the distance between Eindhoven and Munich is not too great. Dr Holtwijk commented: "Such a large project requires a great deal of mutual contact. It means that you need a partner close by."

Distribution

Both enterprises will be working on a single joint basic submicron technology, but Siemens will concentrate on four megabit dynamic memories. Philips will focus on single megabit static memories. According to Dr Holtwijk this work distribution was agreed on in the hope that there would be a greater chance of success if one operates from two different points of view. This approach also provides the opportunity to test the new technology on two products.

Philips already has cooperation agreements with a whole series of chip manufacturers. With Intel, Philips is talking about 8 bit microprocessors. The exchange with Motorola is focussed on 16 bit microprocessors. With RCA, Philips is developing a new set of fast C-mos [Complementary Metal Oxyde Semi-conductor] building stones. And less than a month ago it became known that Philips and Texas Instruments will join forces in developing standard cells for made to order chips. All these cooperative relationships are limited to the development of chips and the so-called "second-sourcing": functioning as second supplier for one another's products.

The agreement with Siemens is so special because it extends to the technology. Dr Holtwijk is aware of only three examples of such a combination of strengths in the chip industry. Under pressure from MITI [Ministry of Trade and Industry], four Japanese companies decided in the early seventies to work together in the area of research and development. "You don't need to be an expert to see that that approach has borne fruit," said Dr Holtwijk. A few American companies have also brought their research activities together in two independent institutes. "With that structure they avoid being able to look into one another's kitchen," said Dr Holtwijk. "But Siemens and Philips are good Europeans. We trust each other. Even if we remain mutual competitors."

Philips, Siemens Compared

Rotterdam NRC HANDELSBLAD in Dutch 11 Oct 84 p 13

[Article: "Half of the European Chip Production"]

[Text] Philips and Siemens are not that far apart in terms of size. Last year Philips' turnover was more than 46 billion guilders. Net profits amounted to 775 million guilders and it employed 343,000 individuals. During the 1982-1983 accounting period, Siemens could boast of a turnover of DM 39.5 billion and net profits of DM 802 million. The corporation employed 313,000 individuals.

Together, Philips and Siemens account for approximately half the European production of chips. Philips is by far number one in Europe with estimated chip sales of nearly 4 billion guilders this year. Siemens is unquestionably in second place in Europe. During the accounting period 1982-1983, the turnover of the German corporation in integrated circuits was nearly DM 500 million.

In Europe, Philips manufactures chips in Nijmegen, Hamburg, Southampton, Zurich and Caen. The establishment in Nijmegen is the largest chip factory in Europe. Furthermore. Philips owns the American chip company Signetics, the sixth largest IC manufacturer in the United States. Siemens has chip plants in Munich and in Villach, Austria. A new establishment is also being built in Regensburg.

Government Subsidies

Rotterdam NRC HANDELSBLAD in Dutch 11 Oct 84 p 13

[Article by Paul Friese: "Government Subsidies Must Prevent Dependence"]

[Text] The Hague, 11 October -- European industries will have to invest in Europe instead of in the United States if they want to withstand competition on the European market from Japan and the United States in the area of high technology.

This is what H. Leliveld, director general for industry in the Ministry of Economic Affairs, said more than 2 months ago during an interview with this newspaper. Therefore he felt that it was very important for contries in Europe to get to work on a bilateral or trilateral basis to produce these investments in their industries.

At that time Leliveld announced that the Netherlands and the FRG, together with Philips and Siemens, were working on setting up a concrete investment project for a whole new generation of chips: In principle, the Dutch government would contribute more than 100 million guilders toward its financing. Meanwhile this amount has increased to a maximum of 190 million guilders (excluding 20 to 30 million guilders in WIR [Investment Account Bill] subsidies), spread over a 5 year period. Once the project really gets off the ground, added Leliveld, then it could spread to other countries and other companies.

Yet this year, the Ministry of Economic Affairs will announce a similar project in the area of biotechnology. Strangely enough, this project will remain limited to the Netherlands. Cooperation with, for example, Denmark or Switzerland, two countries which like the Netherlands have long held strong positions in the biotechnology industry, is not being pursued for this project.

In terms of the present investment project, the Netherlands and the FRG are not only making subsidies available (DM 300 million for the FRG), but both countries have agreed that a joint advisory group, consisting of West German and Dutch independent experts, will follow the progress of the whole project. Hence, cooperation involves more than just making rather sizeable sums of money available. As this involves investments in research and development activities, the two governments are not providing loans but subsidies.

The loan of nearly 1 billion guilders granted to Fokker, for example, for the development of two new airplanes involves support for a concrete product. To subsidize such activities would mean a distortion of competition and hence be contrary to the provisions of the European Community.

Leaders

In a letter to the Second Chamber, Minister Van Aardenne (Economic Affairs) wrote today that he has granted the 190 million guilder subsidy in principle (he expects to make the final allocation early next year) because he sees Philips and Siemens as the only European enterprises capable of becoming leaders in the information technology industry. A spokesman for the Federal Ministry for Research and Technology in the FRG said it frankly: "Everywhere where people occupy themselves with research in the field of submicron technology, the research is supported on a large scale by governments. If we were to lag behind, we would end up in a position of total dependency."

Meanwhile, export oriented high tech companies in the United States are in the process of drastically reviewing their investment plans. There they are starting to believe that the dollar will remain expensive well into the eighties. Therefore they once again want to raise investments in the traditional export areas, such as Europe, in order to serve the market locally. Consequently, the expensive dollar no longer needs to be an obstacle to their marketing in Europe.

Up to now, the export advantage caused by the expensive dollar has given European industry a not unwelcome but easy boost. Some people even claim that it was the wrong kind of boost, because it would only be a temporary spending boost which does not produce investments in high technology. The fact that the American export industry is now getting ready to fight back aggressively has been expected for a long time.

Perhaps the possible wave of American investments which Europe can expect now will provide the right kind of impulse after all and will awaken European countries and seriously move them toward Philips/Siemens type cooperation.

Negative Reaction

Rotterdam NRC HANDELSBLAD in Dutch 12 Oct 84 p 11

[Article by Hans Beugel: "Philips and Siemens Reinvent the Wheel"]

[Text] Amsterdam, 12 October -- "Philips and Siemens are going to reinvent the wheel. The billions they want to spend on developing a superchip would be more usefully and more profitably applied in a different direction. The hundreds of millions which the German and Dutch taxpayers are contributing are guaranteed to be money thrown away."

James Martin, who says this, passes for an authority in futurology. He is the author of about 40 books, among which the bestseller "The Computerized Society," published in 1968. In this book he predicted that in 10 years hobby computers would conquer the world. Which happened, in 1978.

Last night, Martin was able to make his provocative comments in a question and answer game with Professor Dr A.C.R. Dreesmann. This game was played before a distinguished multitude of top automation experts from business and industry and from the administration in Amsterdam. A few of those present dared to doubt the bold statements of the Master.

"They are surely not just going to throw billions down the drain at Philips and Siemens. They are really not that stupid. Martin should first request some more 'information.'"

Quite Correct

However, the representative from IBM felt that James Martin -- who himself worked for IBM for 19 years -- is quite correct. At the Efficiency Exchange Philips came up with the news of the superchip precisely on the day when IBM, in the room next door, introduced a ready-for-use megabit chip to the press. "Isn't something like that a tragedy for our country?"

Alas, there was no Philips doctor in the hall to provide some first aid services. So, Martin sprinkled some more salt into the wounded patriotic feelings. Based on the facts as reported in the press -- the FINANCIAL TIMES -- Philips and Siemens are 5 years too late with their superchip. What should they spend the money on instead? On the development of products they are good at. As far as Philips is concerned, on video and other nice things for people. On training. On research. But then only for researchers less than 30 years old.

They could also think about products and services for which there is a great need. For example, on tools for programmers and systems analysts, the so-called workbench tools. That is the big gap in the market. The work of the automators must be automated. As things are now it costs $1,000 billion to rewrite all the existing software for the future new hardware. And every newborn baby should become a programmer in order to be able to meet the software need. That market for Computer Aided Thinking represents a value of $150 billion.

What should Europe do? Cooperate with the Japanese. And improve the quality of our lives. We Europeans excel in art and literature. In the coming decades, computers and robots will take over all the tedious and unpleasant work; hence, precisely for us Europeans golden times are dawning.

We should produce good television programs and films, plays, painting, writing, according to the Englishman James Martin who "because of the bad business climate which prevails in the United Kingdon" lives in the United States half of the year and in the Bahamas the other half.

Rehired

Dreesmann feels that everything being said is just great. He cannot imagine any better publicity for the "unprecedented" major action by Vendex Software Development in the area of home computers, which he will launch next week.

"As a matter of fact, I was simply rehired for the occasion," he said confidentially. "I can no longer keep up with all those developments and that is not necessary at my age either. But I am going to put a personal computer in my office. Because if I don't do it then it won't be done in the other offices either."

"We have also reached the conclusion that you have to use a different approach for the personal computer market. Not from the bottom but from the top. It is people who work with systems in their job who want something like that at home. It is not primarily doctors, dentists, and the like. That category will buy only later."

"I am afraid though that managers are likely to be so overwhelmed that the sensitivity to information that is really important will be lost. The computer industry has yet to find a solution to that: the selection of relevant information. Furthermore, all that new machinery must become much more user friendly. On the nightstand in my home is one of those fancy soundboxes from Philips with everything on it. My wife wants me to put tape over all the knobs. The only thing she wants to have anything to do with is the knob to turn it on and off.

Positive Reaction

Rotterdam NRC HANDELSBLAD in Dutch 12 Oct 84 p 11

[Article by Dick Wittenberg: "Philips and the Mega-Project"]

[Text] What is good for Philips is good for the Netherlands. They like to use this slogan, and often, at the corporation in Eindhoven. With an eye on the highly desired European cooperation, the proposition is currently even being expanded to Europe. In its generality this Philips wisdom is undoubtedly simplistic, arrogant and shortsighted. But in a few cases the saying unquestionably fits. Such as with the Mega-project, the giant alliance between Philips and Siemens.

A short review of the facts. Philips and Siemens have made it their task to develop in 5 years a basic technology which should make possible the manufacturing of chips with an even smaller structure and hence an even greater memory capacity. Philips will hire some 200 technicians and scientists specifically for the chip research. An amount of 1.5 billion guilders is involved in the project. Philips and Siemens will each pay half a billion guilders. The remaining 500 million guilders will be made up by the Dutch and German governments.

By the end of the eighties, mass production of the new generation chips will be located in Nijmegen and Hamburg. A few hundred jobs will be added in both locations. Investments in manufacturing will involve multiples of the 500 million guilders which Philips is putting into the research.

Billions in investments and a gain of 500 jobs. Not a bad start, but the significance of the Mega-project reaches much farther. A top official in the West German Ministry for Research and Technology calls the new generation chips "the oil of the future." His message is amply clear: a country which is not soon able to command the knowledge recorded on sillicone discs is doomed to decline to the level of a second-rate nation.

Europe is far behind Japan and the United States in the area of micro-electronics. The European chip producers do not even cover half the European need. And this when the application of chips in Europe already lags behind the big competitors. But the sleeping old continent of which the Netherlands is accidentally a part has hesitantly started a catching up operation. The Mega-project of Philips and Siemens is no less than the engine of this operation.

As Mr F. Rauwenhoff (engineer), president of the management of the Philips companies in the Netherlands, said: "By joining together the forces of two European governments and two large enterprises, Europe is getting a unique chance to acquire a leading position in tomorrow's world of micro-electronics."

The strategic importance of the Mega-project is great if only because of the ramifications which can be expected. A specific characteristic of research into such key technology is that the results are never limited to the original field of research. Hence, anyone who is ahead with the new generation chips is also ahead in other areas. Universities and colleges will also be able to draw advantages from Philips' increased research efforts. Furthermore, it is important that the mass production of the new generation chips take place in the Netherlands. It is precisely this combination of research and production which guarantees that other parts of Dutch industry will rapidly get into contact with the new developments. They will be swept along with the unstoppable avalanche of micro-electronics. And finally, the following applies to all enterprises whether they are cigar factories or metallurgical companies: the extent to which they are able to automate determines their competitive strength in the future.

The German and Dutch governments have recognized this importance as witnessed by their generous support for the Mega-project. Project Manager Theo Holtwijk of Philips says frankly: "Without that help, research on this scale would not have been possible."

It still remains a big question whether Philips will succeed in attracting enough highly qualified personnel for the extensive research operation. Mr W. ter Welle from the federation of upper level Philips personnel has already said that the corporation should establish an academic level apprenticeship school if the scientific institutions cannot meet the demand. Philips Manager Holtwijk admits that a shortage of highly trained employees could slow down the progress of the project. Perhaps the future of micro-electronics in the Netherlands lies less in the hands of business and industry than in those of education.

8463
CSO: 3698/41

SCIENTIFIC AND INDUSTRIAL POLICY

FRG'S FRAUNHOFER GESELLSCHAFT TO INCREASE HIGH-TECH RESEARCH

Frankfurt/Main FRANKFURTER ALLGEMEINE ZEITUNG in German 27 Oct 84 p 17

[Article entitled: "Laser Technology Can Be Decisive for Competitiveness"]

[Text] In order to support applied research the Fraunhofer Gesellschaft will steadily expand its research capacities in the so-called high-tech sectors in the next few years. This was stated by the president of the Gesellschaft, Prof Dr Max Syrbe, at the annual meeting in Stuttgart. This is to strengthen the competitiveness of German industry. Thus, for example, in the next 4 years over DM70 million are to be invested in the microelectronics sector in new buildings and the initial outfitting of research institutes. More than DM60 million are planned for the technical sectors of information technology and automation of production, over DM30 million for the technical sectors of process engineering and environmental research. In Aachen a new institute for laser technology is being built, in Syrbe's view a "key technology" which in the future could be decisive for economic competitiveness. By 1988 the regular staff is to be increased by about 700 staff workers. At the end of last year the regular staff comprised 2,700 staff workers plus over 500 scientific assistants.

The Gesellschaft has established that in the past few years expenditures by industry for externally commissioned research grew disproportionately. Thus, according to the findings of the Founders' Association for German Science, the share of these outlays with respect to the total outlays for research and development amounted to about 7 percent in 1981, in contrast to 4.8 percent in 1979.

The Gesellschaft reacted to the altered focuses in research by closing five institutes--including those for radiometeorology, applied hygiene, microscopy and high-pressure plasma physics--by converting three institutes and establishing nine institutes whose focus is in the areas of production automation, labor economics, logistics, new energy systems and microstructure technology.

Last year the range of contract research increased by 13 percent to DM217 million of which DM134 million are for research contracts with enterprises and the state. The rest comes from basic financing by the Federal government and the lender. In addition there are the profits from services amounting to DM12 million and from defense-related research in the amount of DM45 million. In addition to the ongoing outlays there were investments amounting to DM45 million

so that the Gesellschaft developed a financial volume of DM319 million, which was 10 percent more than the previous year. The current size of the budget is over DM340 million.

The Gesellschaft's overall total of 31 institutes receive from industry and state annually 700 to 800 research orders ranging in size from several thousand marks to several million. Among the largest projects is an order by Siemens AG for research and development of new kinds of solar cells with a contract value of DM4.8 million. Of similar magnitude was the order to develop a management information system for automobile manufacturing in the Bremen factory of Daimler-Benz AG.

Of course, the Fraunhofer Gesellschaft does not see its role limited just to passive anticipation of orders. Its own planning group is concerned with technical-scientific predictions in order to be in a position to anticipate to some degree potential objectives. Thus, for example in 1974, the Gesellschaft concerned itself with projects to automate manufacturing operations when such applications eventually began to emerge in industry. If there are no concrete orders in technical areas which are viewed as important for the future, then the institutes become active themselves and try to carry their insights further in discussion groups with industry.

Beyond its own research orders the Gesellschaft is involved in so-called integrated projects in business and science in the context of which state and private research is coordinated in order to promote the transfer of technology. This also takes place, even if not unconditionally supported, by the fact that annually 7 percent of the scientists leave the Gesellschaft, half of whom--30 to 40 people--rotate into industry.

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ERICSSON ENCOUNTERS COCOM TROUBLE WITH AXE SWITCHING SYSTEM

Stockholm DAGENS NYHETER in Swedish 27 Oct 84 p 7

[Article by Lennart Ekdal]

[Text] "The AXE switching system is a 'fantastic machine' that consists of unique Swedish computer know-how plus simple standard American components. We feel a little bitter that the United States can halt our exports to certain countries."

A representative of the Ericsson concern said this to DAGENS NYHETER.

Ericsson has had enormous success with its electronic telephone exchanges. The AXE switchboards are expected to become a Swedish export classic on a level with the Swedish Ball-Bearing Company's ball bearings.

The first switchboards were delivered in 1976. A big order from Saudi Arabia in 1977 provided the big breakthrough. The Saudis also paid cash, which Ericsson plowed back into plants, machinery and new test projects.

So far 55 countries have bought the Swedish telephone switchboards but none of them are eastern countries. Ericsson is barred in principle from selling the AXE system to eastern nations. At certain times the firm can get export licenses from the United States but there is a lot of uncertainty involved and the rules are constantly being tightened up.

Several Ericsson sources also indicated that the relatively small eastern market was of little interest for several reasons:

"If we sell AXE systems to the East we must be prepared to accept 50 tons of bricks as a reciprocal purchase and then agree to finance the deal over a 10-year period."

Ericsson accepts the U.S. technology embargo. Let us look more closely at what the AXE systems involve.

The AXE system can be described as a big software system, in other words a computer program that is clothed in various "costumes," components in the form of circuits, etc.

Now and then Ericsson updates the components as new items are produced, especially in the United States.

The AXE system is based on a central computer, a central intelligence processor with 500,000 instructions--comparable to the complex variations airlines use for their reservation systems.

Entirely Swedish

The routine work--such as noting, calling and receiving numbers--is taken care of by several simpler regional processors.

The entire development work was Swedish from start to finish. Ericsson people talk proudly of its unique "intelligence."

Just compare the AXE system to a Volvo. From 40 to 50 percent of the parts come from other countries. But even if the transmission, ignition system and other parts are imported, the car is regarded as an entirely Swedish product. What counts is the overall concept and the execution.

The United States does not deliver any strategic components for the AXE, just ordinary standard parts. Actually Ericsson could buy its standard components from Japan, which is competing heavily in this field, or even from the Soviet Union.

Ericsson's buyers feel the United States has the broadest range of components and it is a reliable supplier. And they probably feel it is good to have smooth business contacts the day that Ericsson wants to buy tailor-made special circuits for rapid computers from the United States.

Superiority

The U.S. superiority in high technology can be explained like this:

Traditionally research has a strong position. "In some places Nobel prize winners pop out of every other corridor," to quote a Swedish computer employee.

The big companies realize the value of being first and they give research workers the resources they need. Risk capital in large quantities flows into places like California's Silicone Valley.

The space program and the military provide the foundation for great progress in the field of electronics.

We cannot compare this to Sweden's investments in Kista outside Stockholm, Asea-Hafo or Ericsson's subsidiary, Rifa.

Sweden can never manufacture standard components and compete in that area. Swedish firms must choose small specialized areas.

"The European component industry is a catastrophe. Marketing is extremely sluggish," they say at Ericsson.

In the series on "The Electronics Battle," DAGENS NYHETER has talked a lot about the technology transfer from West to East that occurs on many levels.

For example the Russians often copy the western technology that comes into their hands. The individual components in the AXE system are not difficult to copy. But naturally it takes some time to copy 50 components.

It may seem surprising that Ericsson does not protest more vigorously against the American export ban on standardized harmless computer components. The reason Ericsson's management does not make a fuss may be that they are quite concerned about having good relations with the United States while at the same time they regard the eastern market as slow and complicated.

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